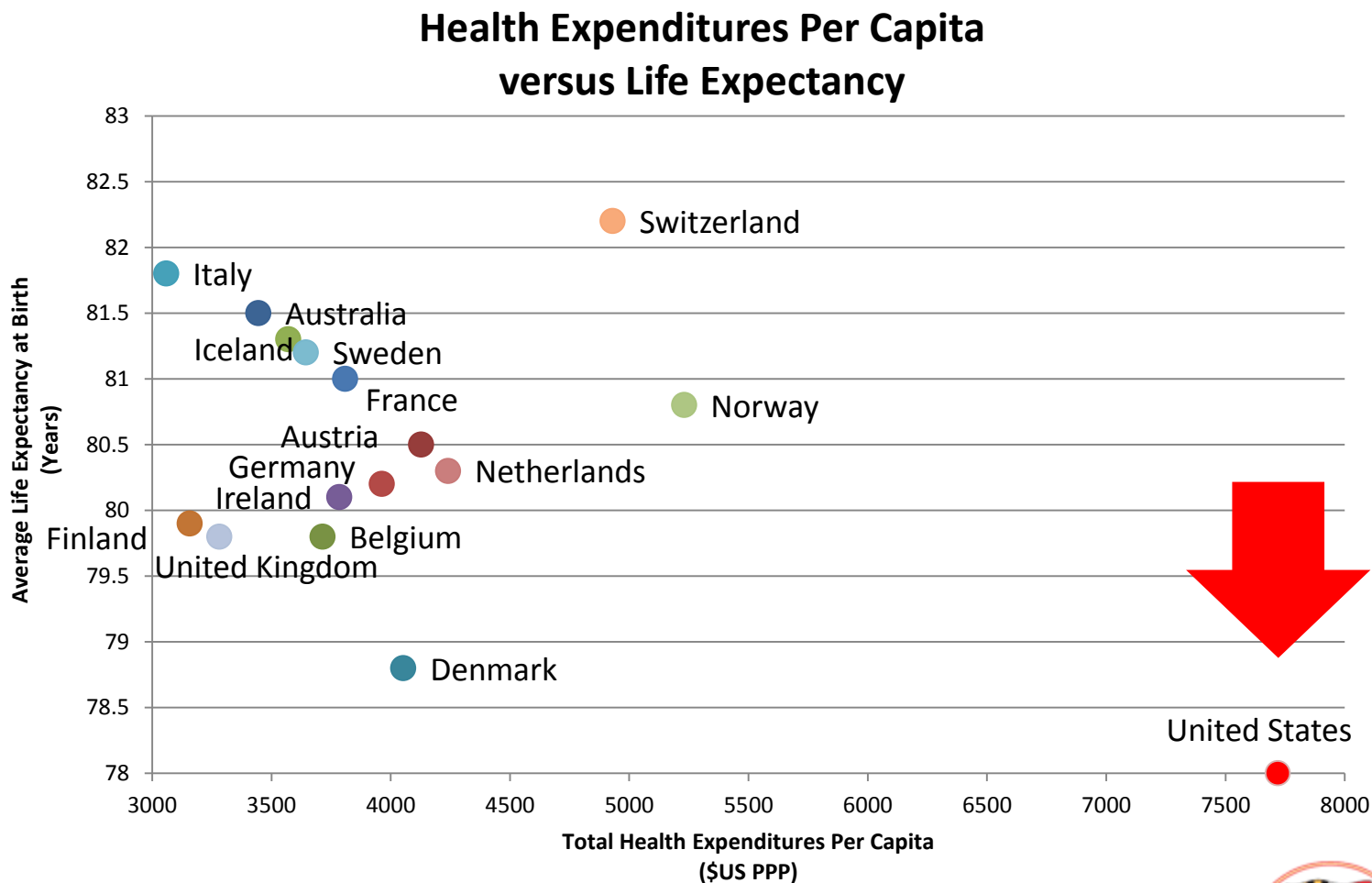# Data and Public Health

Laura Herrera Scott MD, MPH

Deputy Secretary of Public Health

Maryland Department of Health and
Mental Hygiene

Relationship between Spending and Longevity

Health Expenditures Per Capita versus Life Expectancy

Average Life Expectancy at Birth (Years) vs. Total Health Expenditures Per Capita ($US PPP)

Data points:
- Switzerland
- Italy
- Australia
- Iceland
- Sweden
- France
- Norway
- Austria
- Germany
- Netherlands
- Ireland
- Finland
- Belgium
- United Kingdom
- Denmark
- United States

Source: OECD Health Data 2011

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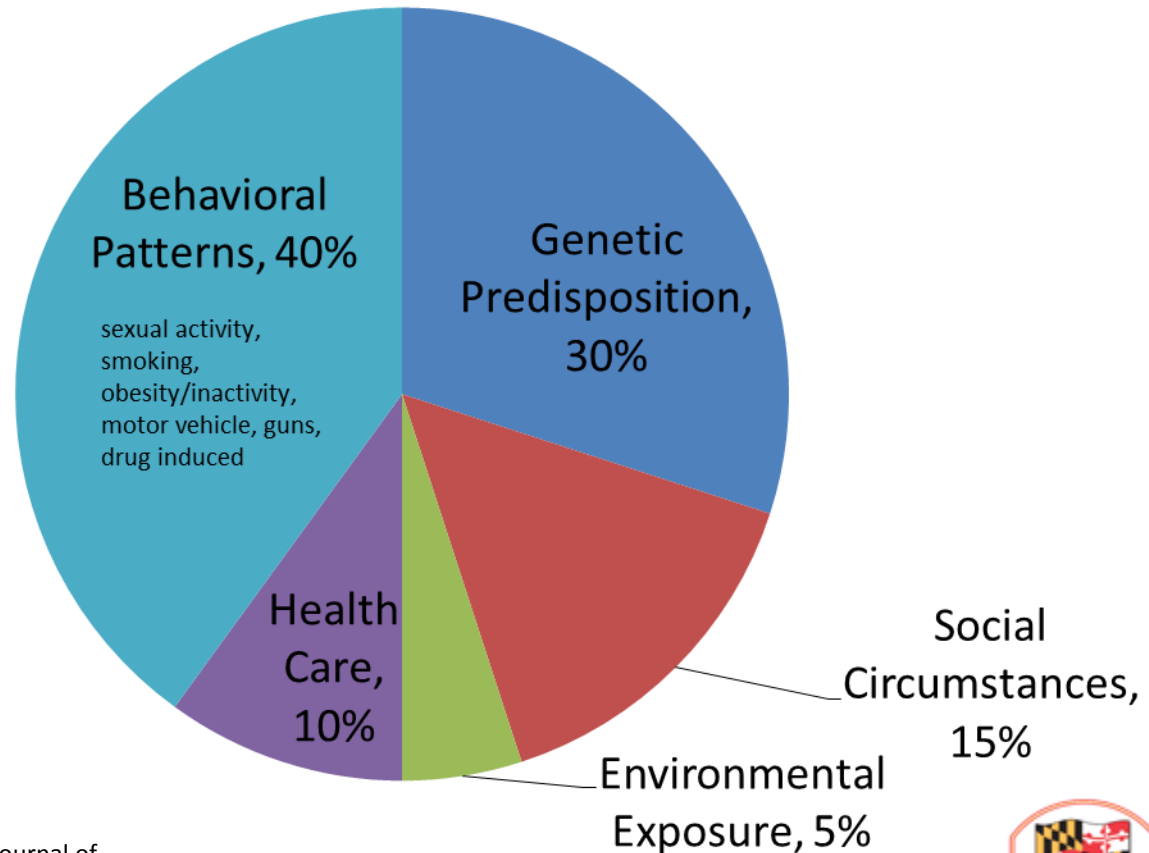
Coverage + Care + Prevention

Annual Costs (Health Care And Program Spending), Three Layered Intervention Scenarios, Year 0 To Year 25
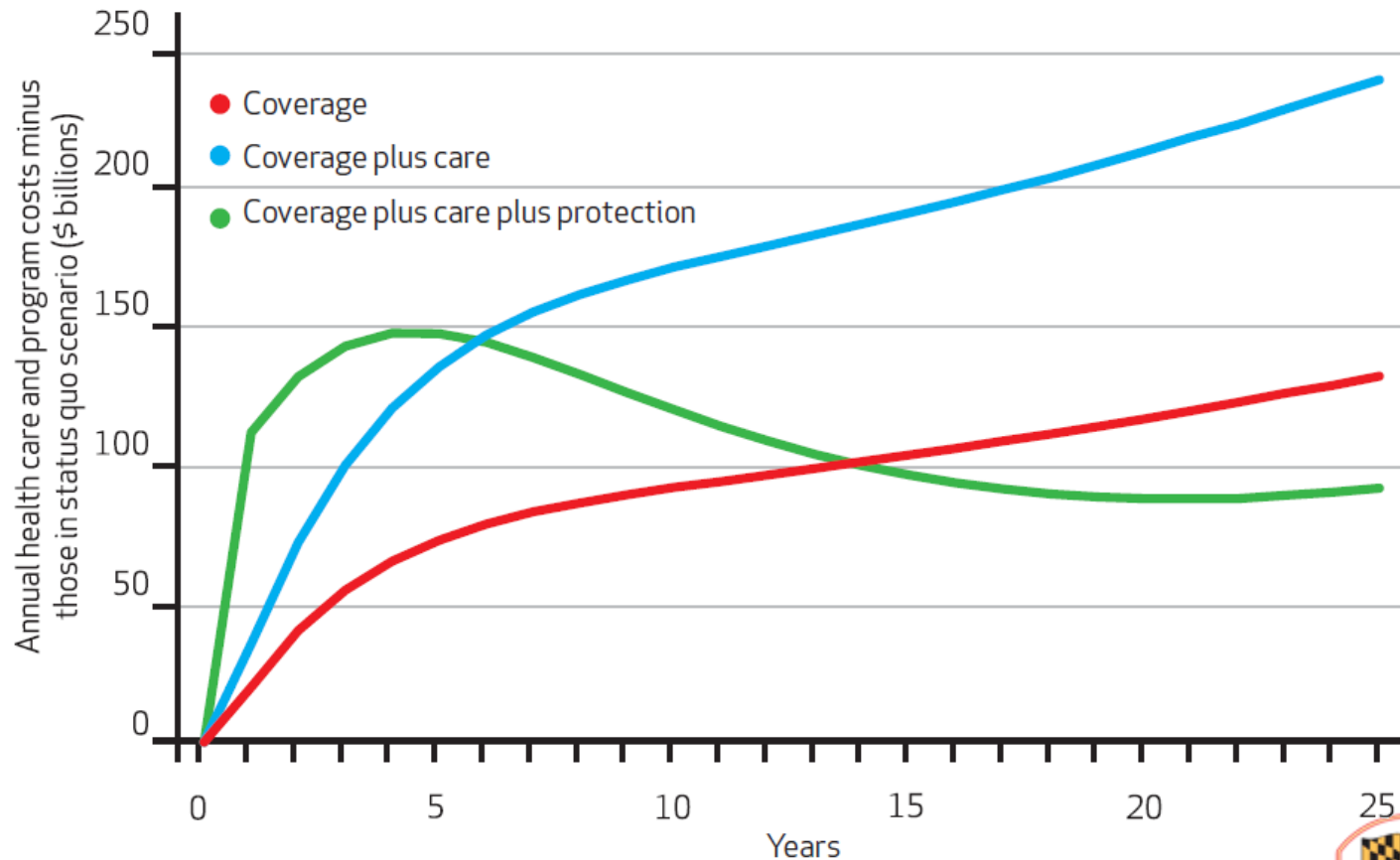
Milstein, et al. "Why Behavioral and Environmental Interventions are Needed to Improve Health at Lower Cost". *Health Affairs* 2011.

Non-Medical Determinants of Health

Integration of public health and the medical delivery system is required if our goal is to improve health of the individual and population.

Behavioral Patterns, 40%

sexual activity, smoking, obesity/inactivity, motor vehicle, guns, drug induced

Genetic Predisposition, 30%

Health Care, 10%

Environmental Exposure, 5%

Social Circumstances, 15%

Source: Steven A. Schroeder, New England Journal of Medicine, Sept 20, 2007

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Strategic Approach

Five Key Components

Five Key Initiatives

1. Promote access to care → Planning for Access

2. Promote wellness & community health thru public health/medicine integration → State Health Improvement Process

3. Address pockets of intense health disparities → Health Enterprise Zones

4. Reform incentives for hospitals → Modernizing the Waiver

5. Use mapping, hot-spotting, and data analysis to support robust primary care and community outreach → The State Innovation Model

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State Health Improvement Process (SHIP)

- Framework and resources to align local action to continuously improve population health and health equity

- 20 Local Health Improvement Coalitions
  - Typically Co-Chaired by Hospital and Public Health leaders and include cross-section of health and human services

- State and Local Accountability
  - 40 measures: health outcomes and determinants
  - State and county baselines and 2014 targets
  - Racial/ethnic disparity information

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20 Local Health Improvement Coalitions (LHICs) Across Maryland
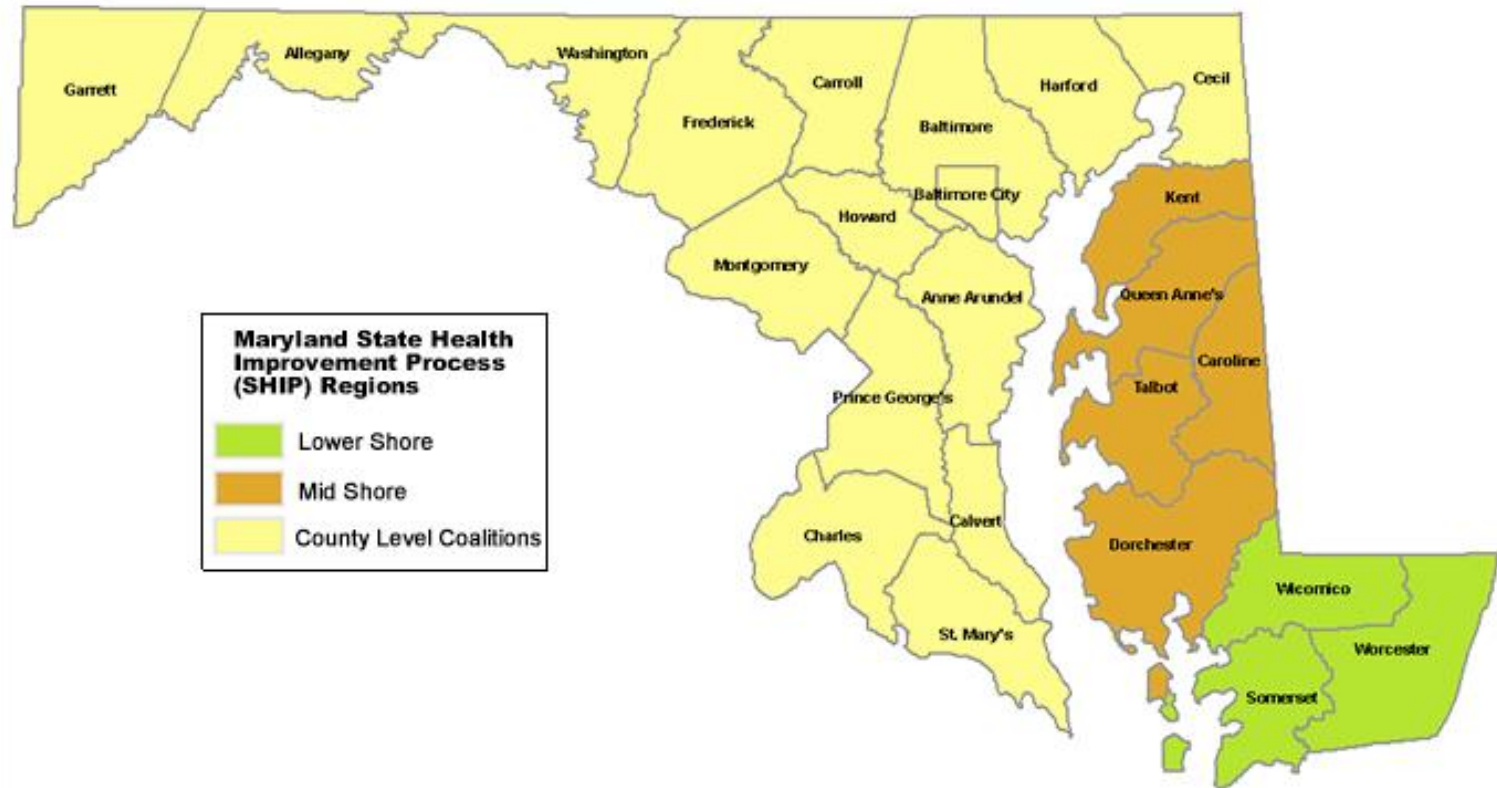
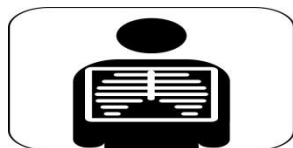# Aligned Action in 5 Focus Areas to Increase Life Expectancy

- Healthy Beginnings

- Healthy Living

- Healthy Communities

- Access to Care

- Quality Preventive Care

Maryland's Unique Community Health Capacity

- State Health Improvement Process:
  - 40 goals for health
  - 20 public-private coalitions
  - Integrated online data and engagement for citizens

SHIP 1.0: SHIP County Profiles

High Impact Objectives

Figures in RED/GREEN represent when the county baseline is WORSE/BETTER than the state baseline.

Obj #	SHIP Measure (County Baseline Source)	County Baseline	Maryland Baseline	Maryland 2014 Target
High Morbidity Impact				
17	Rate of ED visits for asthma per 100,000 population (HSCRC 2010)	535.3	850.0	671.0
27	Rate of ED visits for diabetes per 100,000 population (HSCRC 2010)	258.1	347.2	330.0
28	Rate of ED visits for hypertension per 100,000 population (HSCRC 2010)	183.7	237.9	225.0
34	Rate of ED visits for a behavioral health condition per 100,000 population (HSCRC 2010)	1,085.2	1,206.3	1,146.0
High Mortality Impact				
25	Rate of heart disease deaths per 100,000 population (age adjusted) (VSA 2007-2009)	227.6	194.0	173.4
26	Rate of cancer deaths per 100,000 population (age adjusted) (VSA 2007-2009)	189.3	177.7	169.2
Multiple Impact Objectives (those objectives with a high rate of return on investment)				
3	Percentage of births that are LBW (VSA 2007-2009)	7.0%	9.2%	8.5%
6	Percentage of births where mother received first trimester prenatal care (VSA 2007-2009)	86.0%	80.2%	84.2%
11	Percentage of students who graduate high school four years after entering 9th grade (MSDE 2010)	91.1%	80.7%	84.7%
30	Percentage of adults who are at a healthy weight (not overweight or obese) (BRFSS 2008-2010)	30.5%	34.0%	35.7%
31	Percentage of youth (ages 12-19) who are obese (MYTS 2008)	9.4%	11.9%	11.3%
32	Percentage of adults who currently smoke (BRFSS 2008-2010)	18.6%	15.2%	13.5%
33	Percentage of high school students (9-12 grade) that have used any tobacco product in the past 30 days (MYTS 2010)	25.8%	24.8%	22.3%

Network of Care
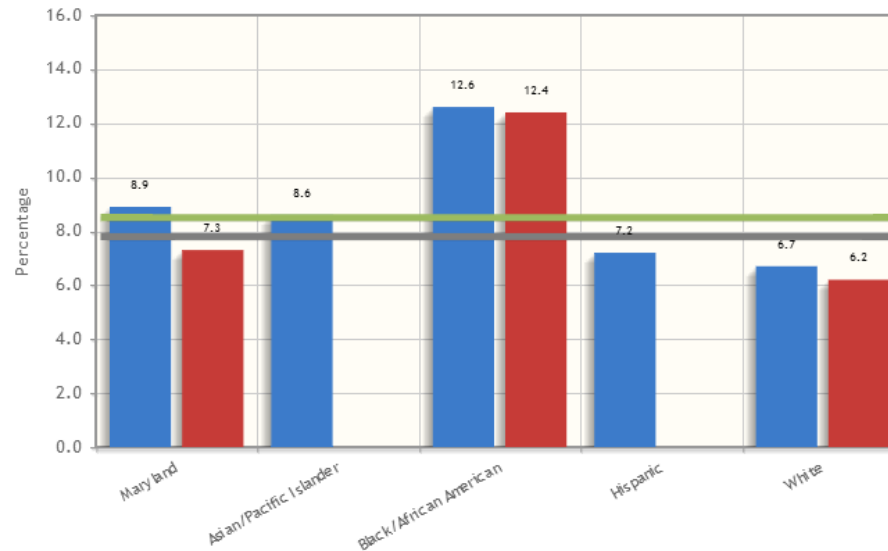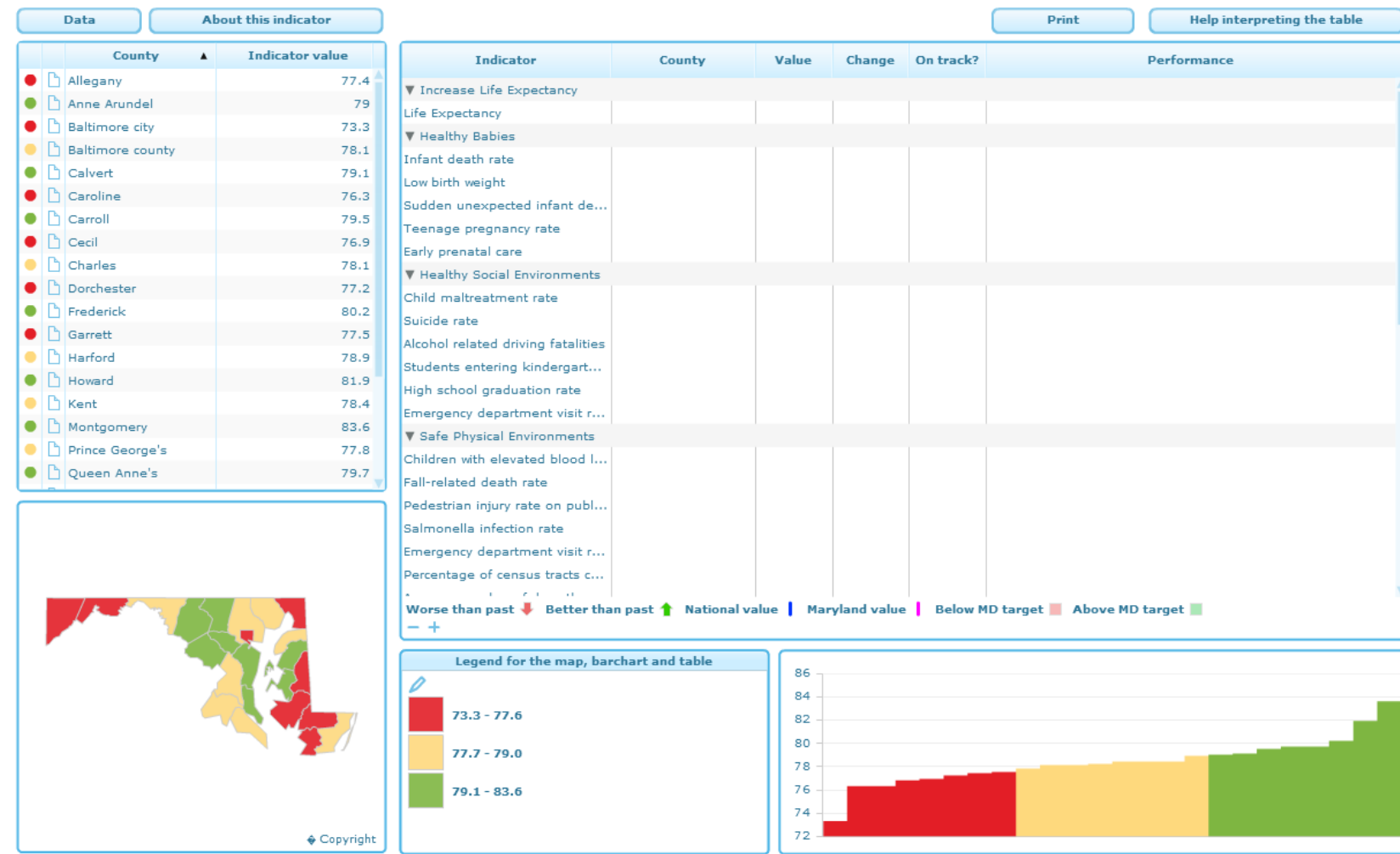
Network of Care

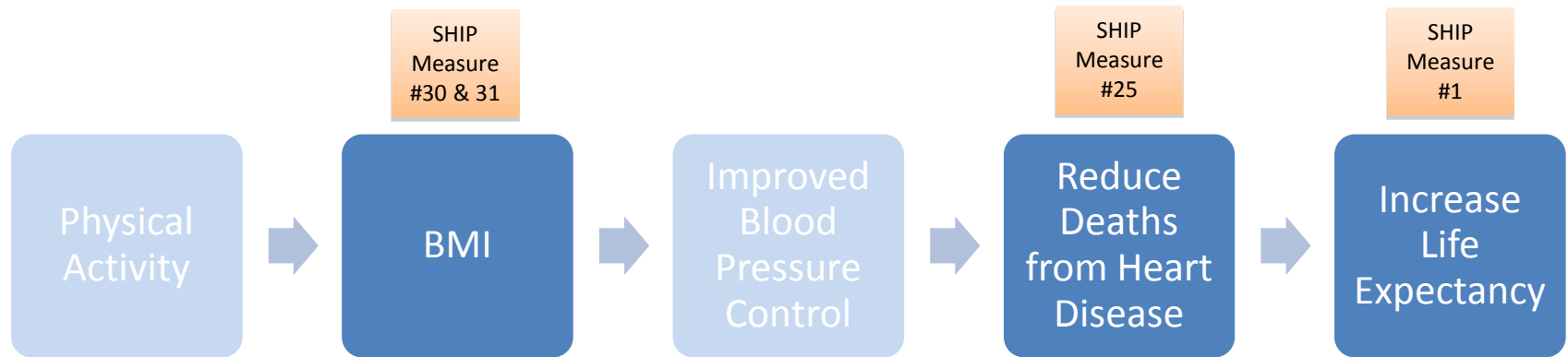## Increase Life Expectancy >> Life Expectancy >> 2008-2010

Use the 'Data' button to select an indicator to view on the map, bar chart and data table. Select a county in the map, data table or bar chart to see the performance of that area in the spine chart, hold down ctrl or shift to select multiple areas. Use the notes icons to view more details on an indicator. The 'About' tab displays indicator details (in place of the legend at the bottom). The legend colours show equal sized groups, use the pencil icon to edit these settings.

| Data | About this indicator | | Print | Help interpreting the table |

County ▲	Indicator value
● Allegany	77.4
● Anne Arundel	79
● Baltimore city	73.3
● Baltimore county	78.1
● Calvert	79.1
● Caroline	76.3
● Carroll	79.5
● Cecil	76.9
● Charles	78.1
● Dorchester	77.2
● Frederick	80.2
● Garrett	77.5
● Harford	78.9
● Howard	81.9
● Kent	78.4
● Montgomery	83.6
● Prince George's	77.8
● Queen Anne's	79.7

Indicator	County	Value	Change	On track?	Performance
▼ Increase Life Expectancy					
Life Expectancy					
▼ Healthy Babies					
Infant death rate					
Low birth weight					
Sudden unexpected infant de...					
Teenage pregnancy rate					
Early prenatal care					
▼ Healthy Social Environments					
Child maltreatment rate					
Suicide rate					
Alcohol related driving fatalities					
Students entering kindergart...					
High school graduation rate					
Emergency department visit r...					
▼ Safe Physical Environments					
Children with elevated blood l...					
Fall-related death rate					
Pedestrian injury rate on publ...					
Salmonella infection rate					
Emergency department visit r...					
Percentage of census tracts c...					

Worse than past ⬇ Better than past ⬆ National value | Maryland value | Below MD target ▮ Above MD target ▮
— +

Legend for the map, barchart and table

Colour	Range
🟥	73.3 - 77.6
🟨	77.7 - 79.0
🟩	79.1 - 83.6

⬧ Copyright

SHIP Data and Analytics

- For planning:
  - To assist in priority-setting around identified community health needs

- For performance monitoring:
  - To assist in continuous quality improvement
  - To identify best practices through comparative analysis
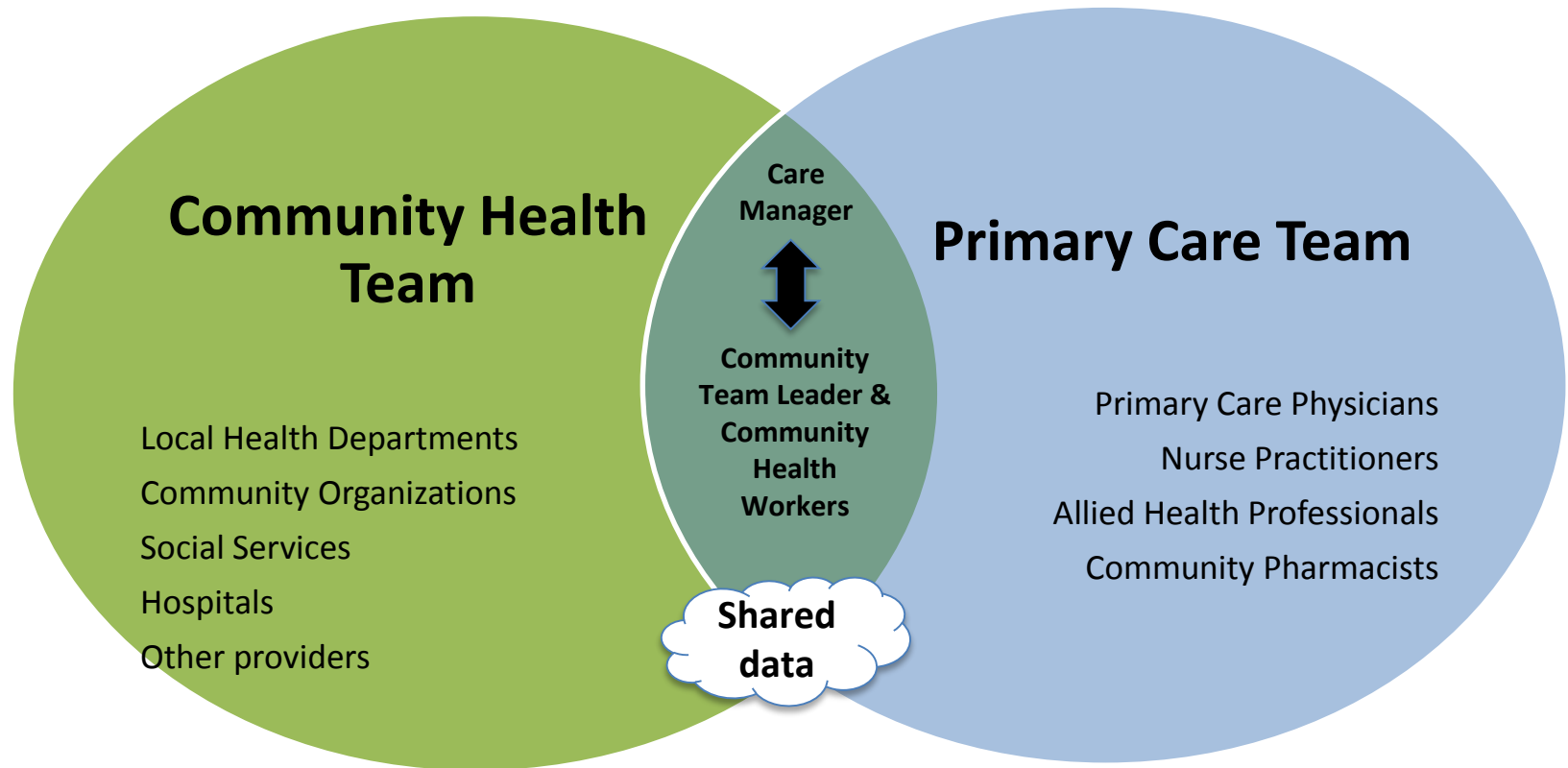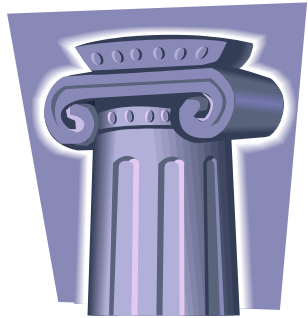
Improving Heart Disease Outcomes

Physical Activity → BMI → Improved Blood Pressure Control → Reduce Deaths from Heart Disease → Increase Life Expectancy

- BMI: **SHIP Measure #30 & 31**
- Reduce Deaths from Heart Disease: **SHIP Measure #25**
- Increase Life Expectancy: **SHIP Measure #1**

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Five Key Initiatives

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Community-Integrated Medical Home

Community Health Team

Local Health Departments

Community Organizations

Social Services

Hospitals

Other providers

Care Manager

Community Team Leader & Community Health Workers

Shared data

Primary Care Team

Primary Care Physicians

Nurse Practitioners

Allied Health Professionals

Community Pharmacists

4 Pillars of CIMH

Pillar #1   Primary Care - strong primary care, focusing on highest risk populations

Pillar #2   Community Health - alignment of public health resources through Community Health Hub

Pillar #3   Workforce Development

Pillar #4   Strategic Data Use

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Pillar #4: Strategic Use of Data

- During SIM Model Design, CRISP established the technical and data infrastructure and the analytic framework necessary to operate a statewide reporting solution designed to support CIMHs.

- The objective of the Model Design grant was to invest in the proof of concept reporting technology and create a large scale population health infrastructure capable of responding to an array of cross entity data needs.

- CRISP and DHMH have developed this reporting technology and are positioned to deploy it to support the community-based population health data needs.

Chesapeake Regional Information System for our Patients (CRISP)

- State-designated health information exchange

- **Mission :** We will enable and support the healthcare community of Maryland and our region to appropriately and securely share data in order to facilitate care, reduce costs, and improve health outcomes.

- **Vision:** To advance health and wellness by deploying health information technology solutions adopted through cooperation and collaboration.

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Master Patient Index
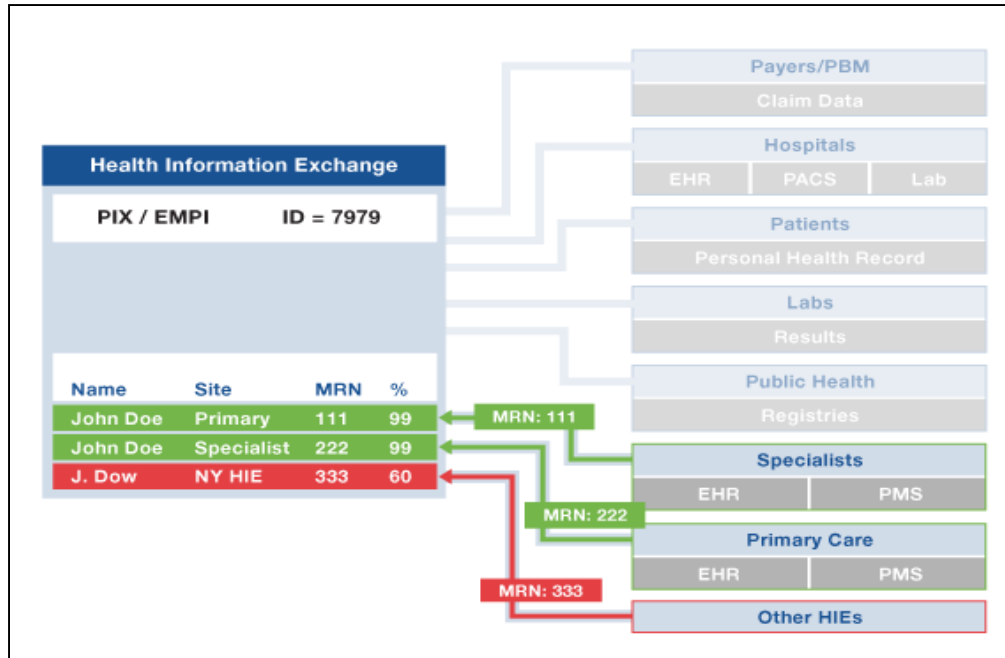
The Challenge
Accurately and consistently linking identities across multiple facilities to create a single view of a patient.

CRISP receives real-time hospitalization events from every hospital in Maryland and links identities to create a single Unique ID

Accurate cross-entity patient identity management is a fundamental requirement for population-level measurement, utilization trending, and care coordination.
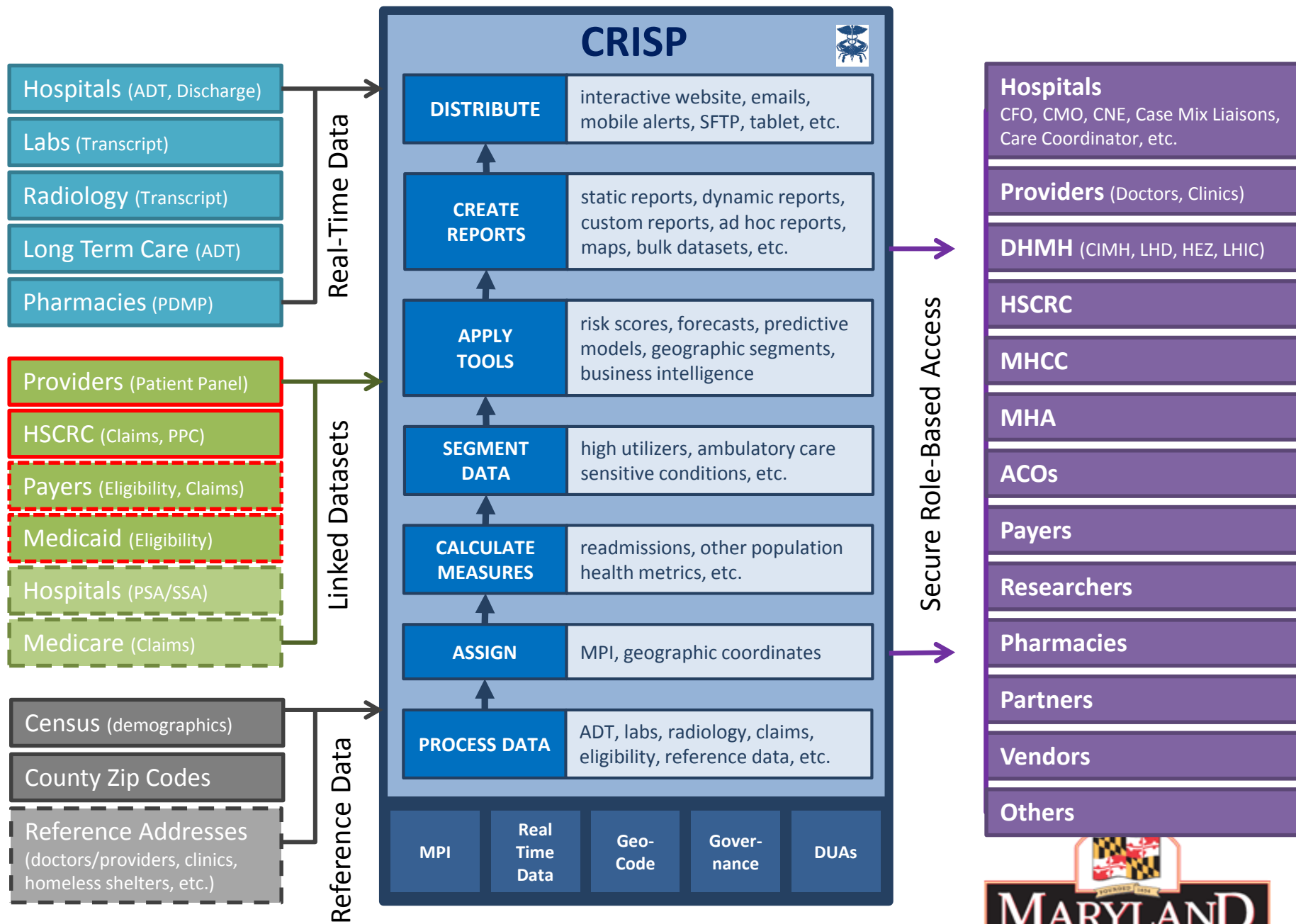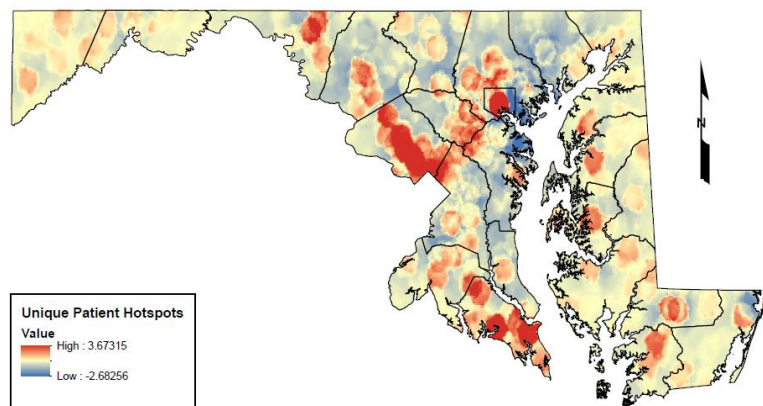
Encounter Notification Service

- ENS enables CRISP participants to receive real-time notifications when one of their patients or members is hospitalized.

- The alerts are generated from the "ADT" messages and Care Summary documents CRISP receives from Maryland hospitals.

- Participants can only subscribe to "active patient or members"

- If an individual has opted out of the HIE, an alert will not be triggered.

- There are currently over 4,500,000 patients subscribed to with in ENS resulting in over 10,000 notifications per day.

GIS Mapping Capability

- Based on the indexed utilization information CRISP can produce visualizations of hospital utilization data in near real time.

- CIMH can leverage geographic data to better understand localized use of services and opportunities for the most efficient / targeted interventions.
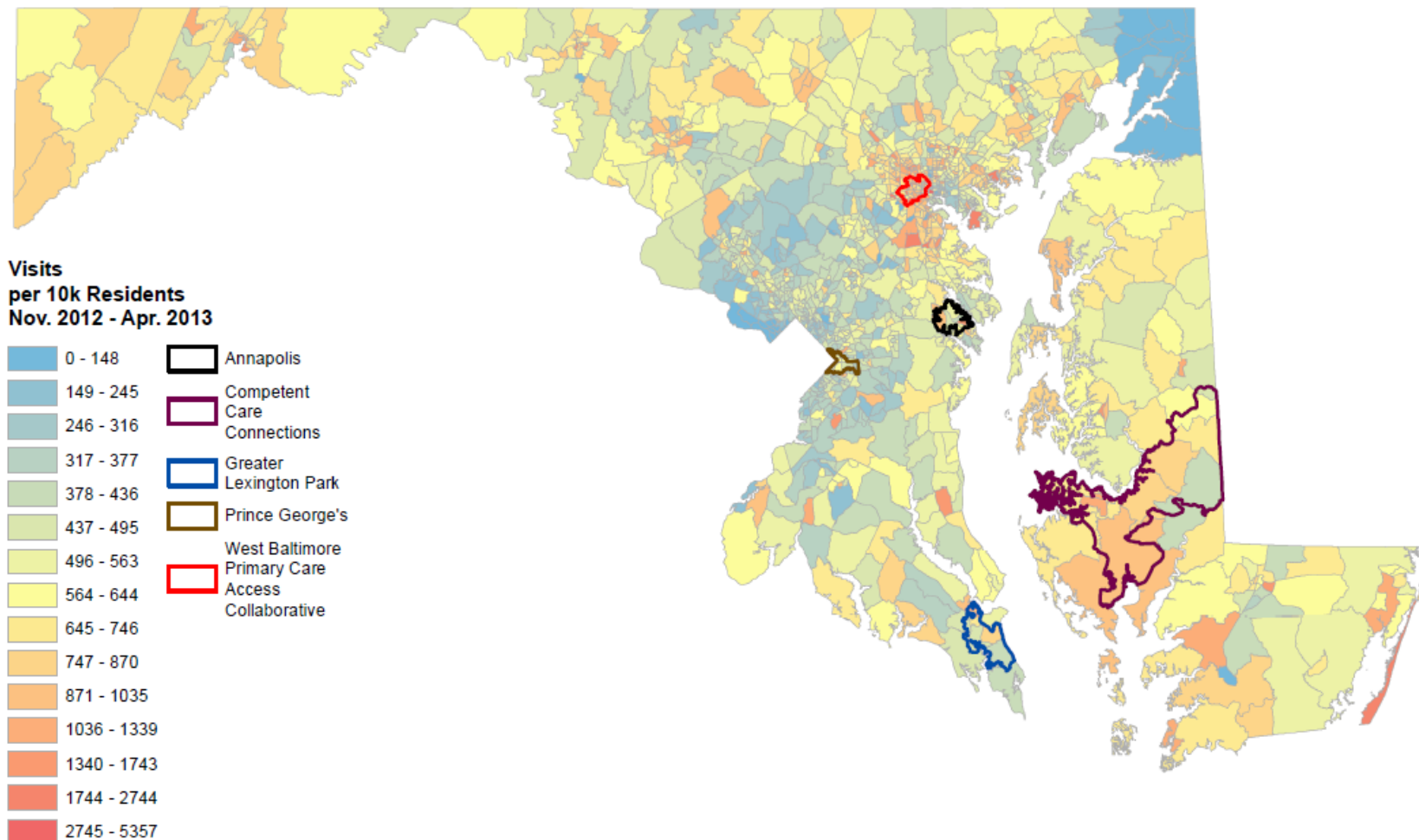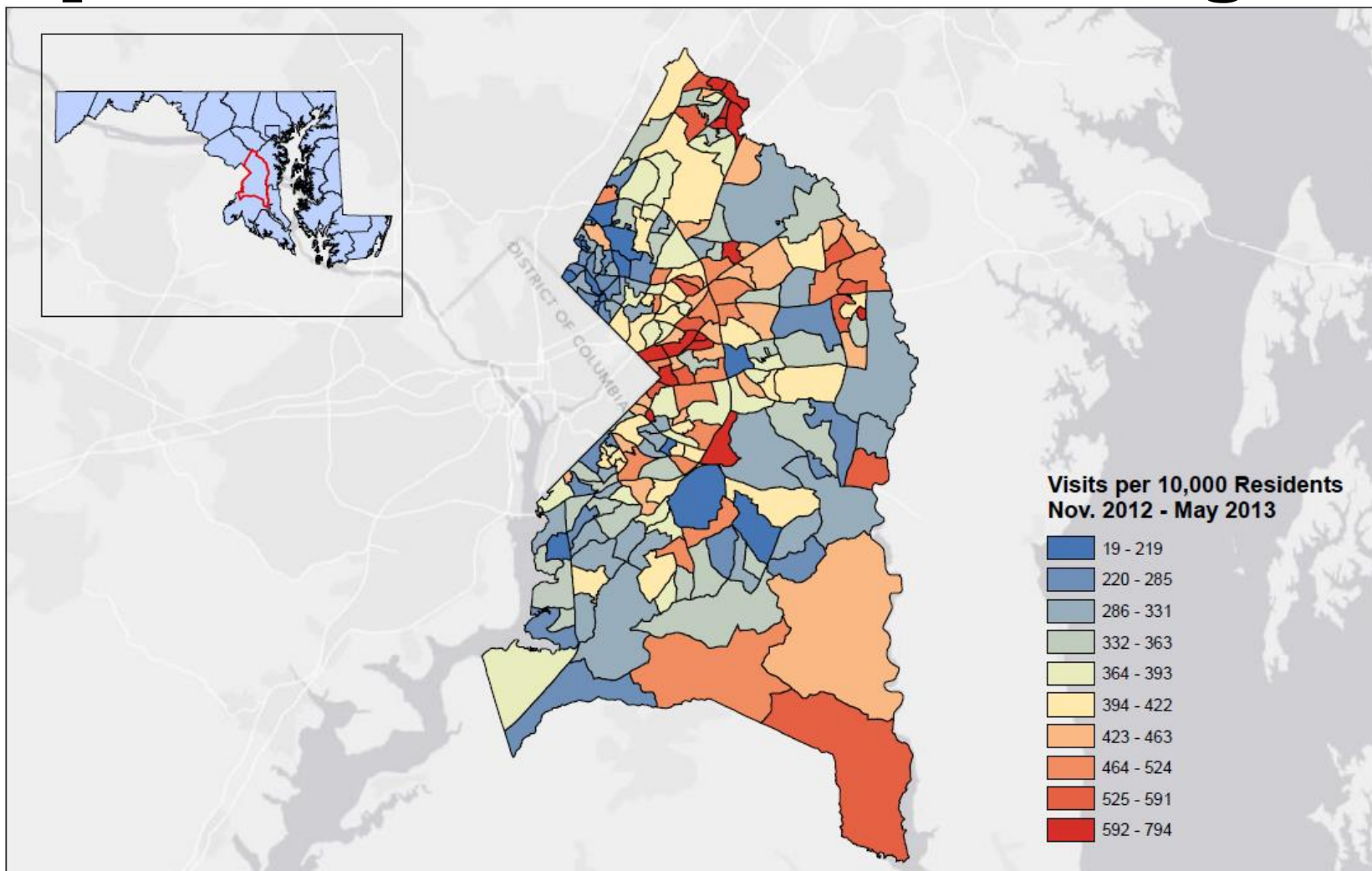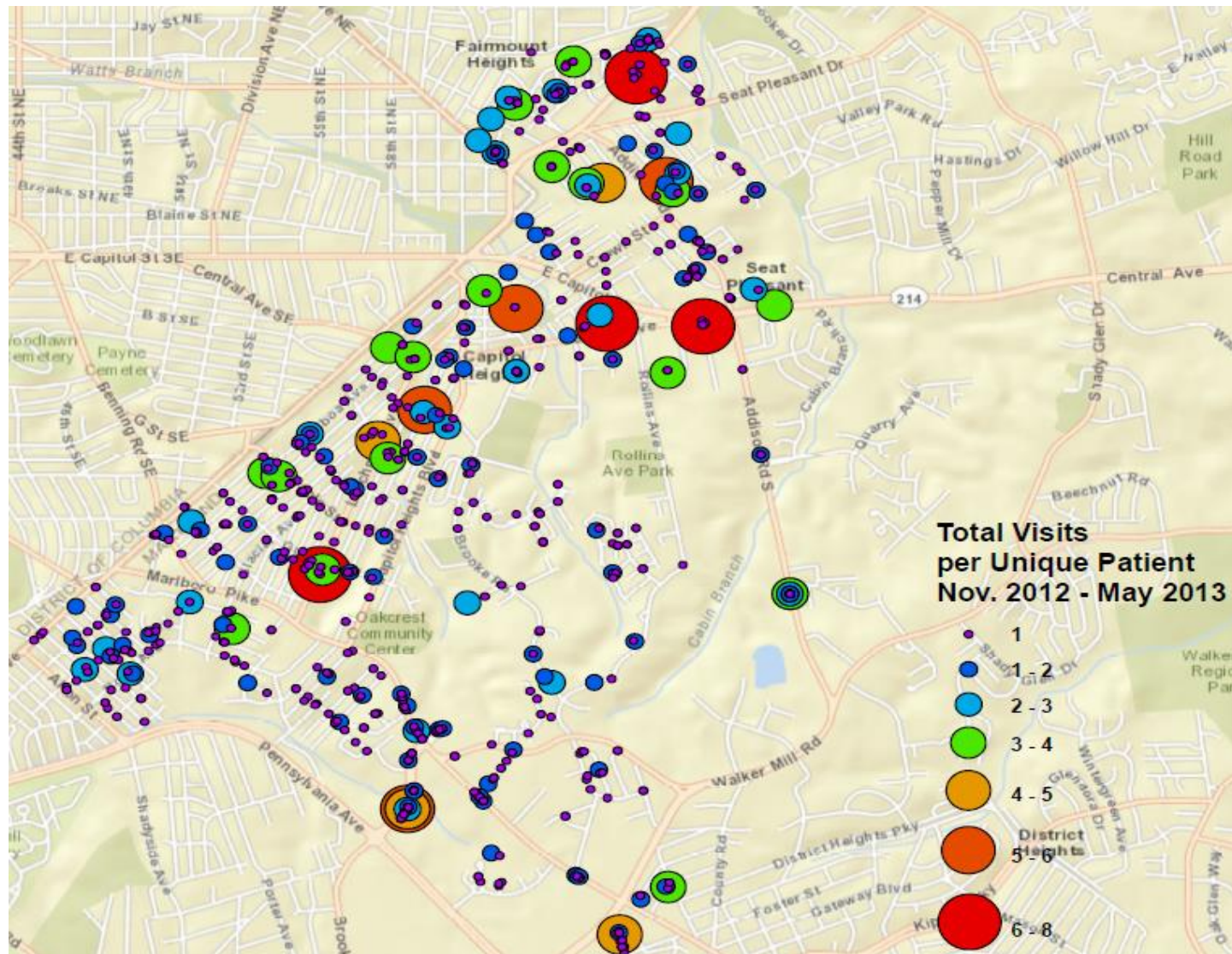
Unique Patients

Top 1% Patients
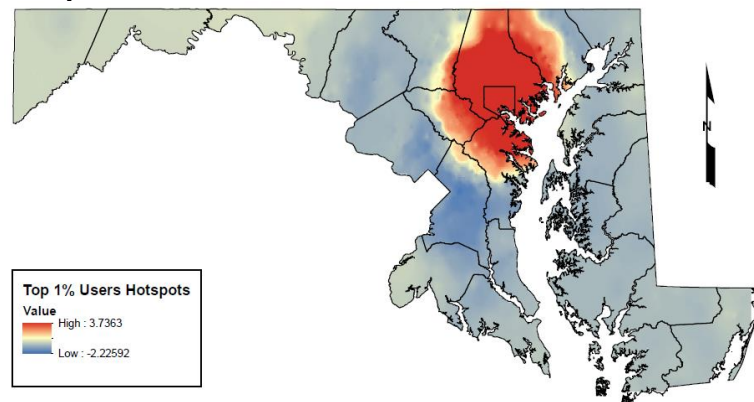
Inpatient Utilization by Census Tract

Visits per 10k Residents Nov. 2012 - Apr. 2013

0 - 148	Annapolis
149 - 245	Competent Care Connections
246 - 316	
317 - 377	Greater Lexington Park
378 - 436	Prince George's
437 - 495	West Baltimore Primary Care Access Collaborative
496 - 563	
564 - 644	
645 - 746	
747 - 870	
871 - 1035	
1036 - 1339	
1340 - 1743	
1744 - 2744	
2745 - 5357	

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Inpatient Utilization, Prince George's Co.

Visits per 10,000 Residents
Nov. 2012 - May 2013

- 19 - 219
- 220 - 285
- 286 - 331
- 332 - 363
- 364 - 393
- 394 - 422
- 423 - 463
- 464 - 524
- 525 - 591
- 592 - 794

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Inpatient Utilization, Capitol Heights

*simulated data

Patients with Overdoses at Maryland Hospitals

Inpatient Discharges

Discharges	2,930
Unduplicated Patients	2,723
Total IP Charges (including ED)	$34,426,745
Dollars Per Discharge	$11,750

Emergency Department Visit - No Inpatient Admission

Visits	5,039
Unduplicated Patients	4,668
ED Charges	$3,696,159
Dollars per Discharge ED	$734

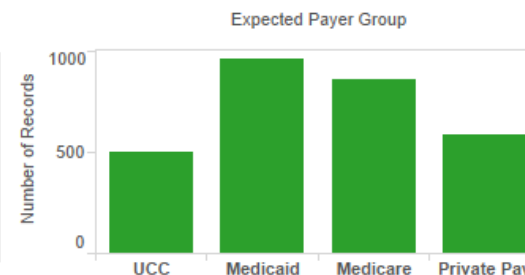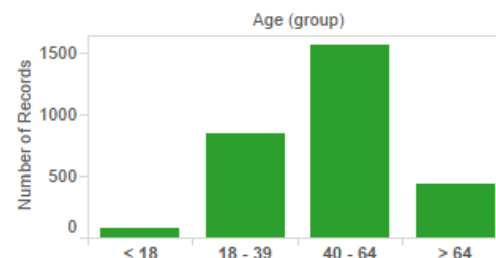## Emergency Department Visit - Patient Admitted to the Hospital

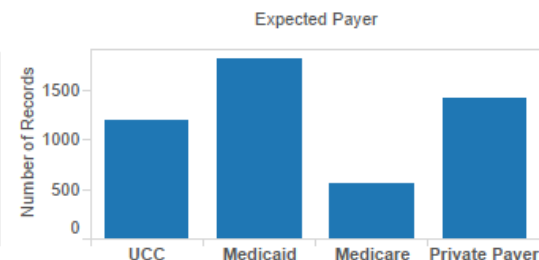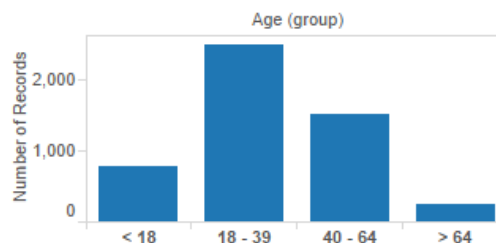| Discharges	2,746
Unduplicated Patients	2,566
ED Charges	$2,202,181
Dollars Per Discharge ED	$802

Top 10 ICD 9 by IP Discharges

OD Drugs	Discharges	Unduplicated Patients	ED Charges
Poisoning by Analgesics (Herion)	1,029	988	$794,311
Posining by Psycotropic Agents (Benzo)	425	413	$320,837
Poisoning by Stimulants (Cocaine)	358	325	$378,683
Other Not Yet Grouped	219	218	$181,763
Psychosis	105	105	$77,348
Poisoning by Sedatives	104	104	$74,505
Poisoning by Other Drugs	89	86	$60,968
Poisoning by Alcohol	76	76	$56,783
Septicimia	70	70	$55,141
Lung Disease (Acute Repiratory Failure)	43	42	$29,113

*Map data not normalized by population

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Inpatient Discharges

Age (group)

Expected Payer Group
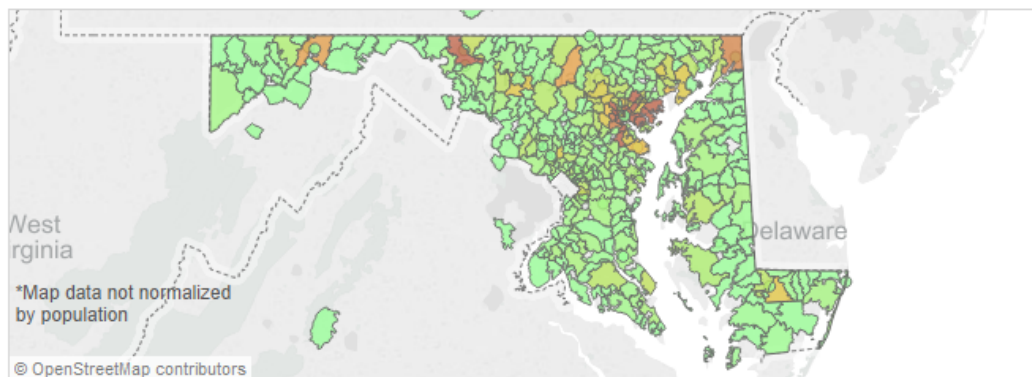
ED Visits without IP Admission

Age (group)

Expected Payer

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Inpatient Discharges and Readmission Rate

Discharges or Cost?

| Discharges ▼ |

Statewide Inpatient Discharges and Readmission Rate

What does this dashboard do?
- Compares statewide and county inpatient discharge volume and readmission rates
- Filters data on demographics such as age and gender

Slide to select a date range

January 2013   December 2013

Expected Payer Group

| Medicaid ▼ |

Age Group

| 18 - 39 ▼ |

Gender

| (All) ▼ |

Race   CAUTION!!

| (All) ▼ |

Click on the county below

Readmit Rate
Discharges/Costs
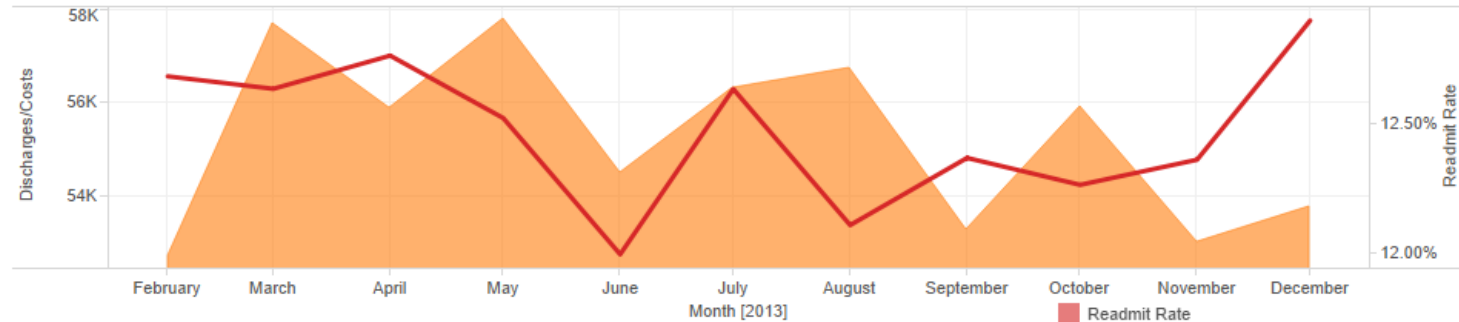
Inpatient DIscharges and Readmissions Rate by Selected Demographics and County
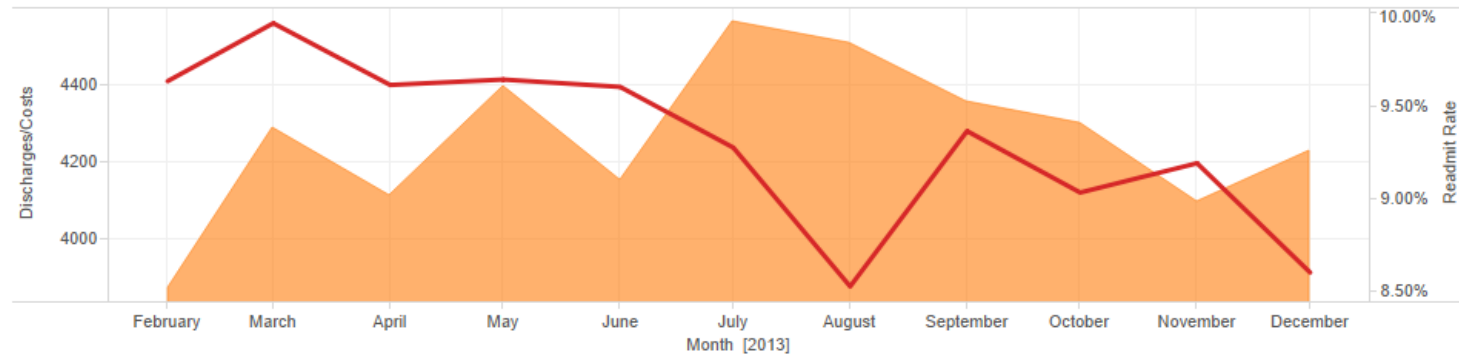

County Inpatient Discharges and Readmissions

County	Discharges/Costs	Readmissions
30	11,521	1,519
03	7,136	672
16	6,118	450
15	5,021	271
02	2,942	264
12	1,293	112
10	1,284	82
21	1,262	90
13	1,144	66
22	851	35
08	832	52
06	805	48
01	748	63
07	744	54

Readmission Rate by Zipcode

© OpenStreetMap contributors

8.00%   15.00%
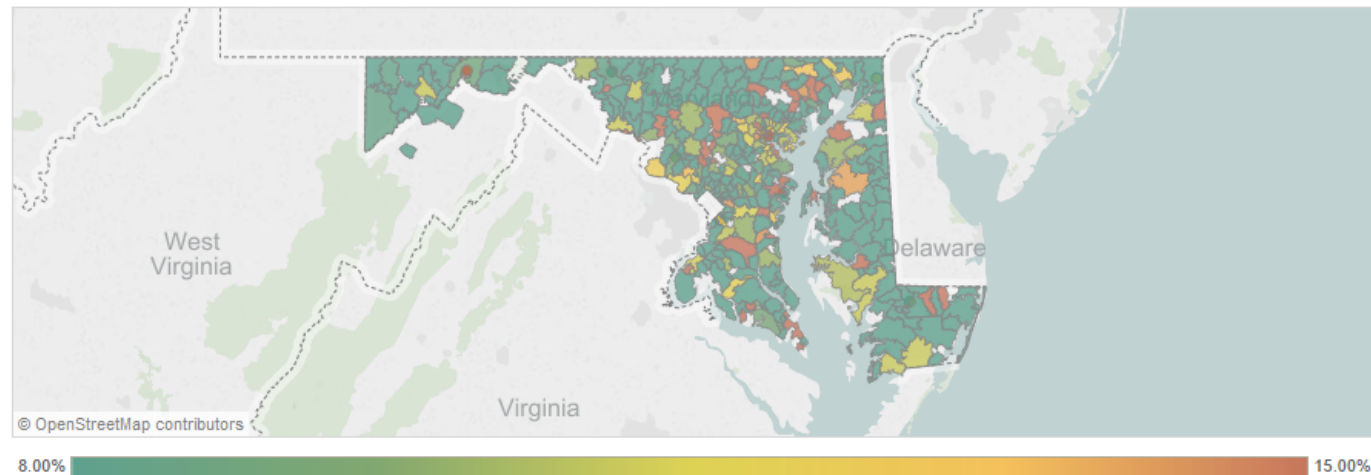
Electronic Clinical Quality Measures

- Through funding under the HITECH I-APD HIE funding effort, CRISP is deploying the open-source popHealth clinical quality measures solution.

- Maryland's deployment of popHealth will be leveraged to support eCQM-related aspects of the Model Test effort.

- LTC and other relevant provider organization will be able to submit structured documents to the popHealth solutions to enable CQM calculation and reporting.
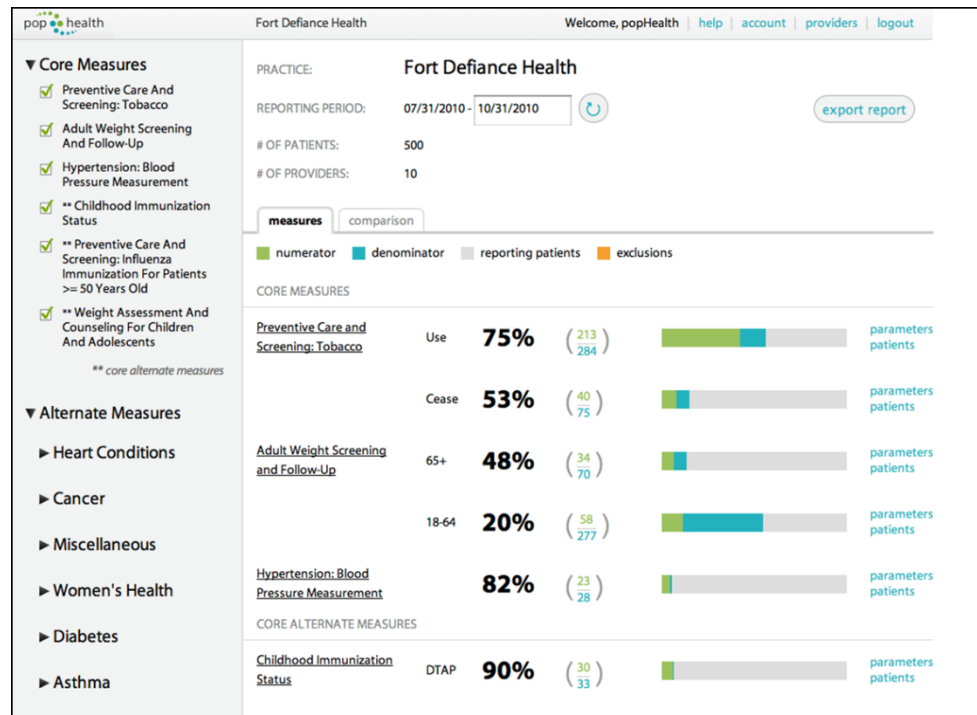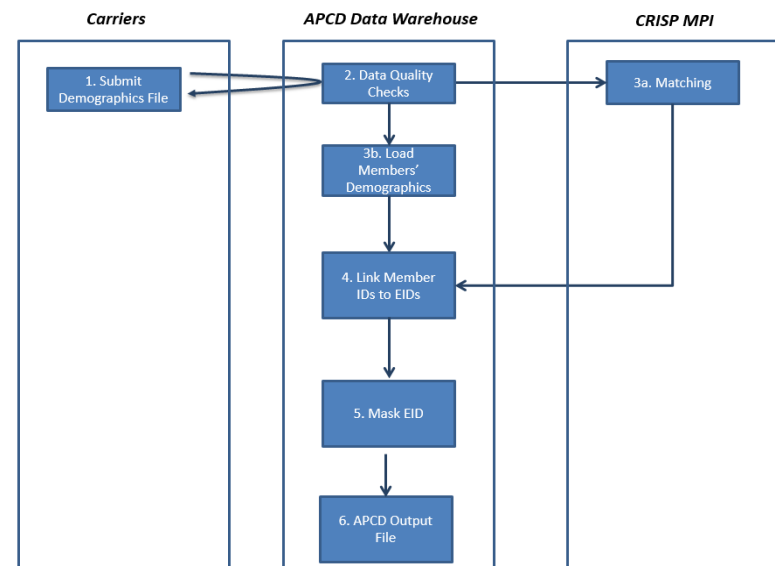
Overview of All-Payer Claims Database

- 1993 law required creation of an APCD, operated by the Maryland Health Care Commission
  - Required private carriers (with ≥ $1 million in premiums) to submit paid claims information for Maryland residents to the MHCC

- Annual private insurer data submissions
  - Content for each year set by MHCC, with carrier input
  - 11 carriers submit data
  - Professional (78.8 million), Institutional (3.7 million), Rx (21.0 million), Eligibility (3.6 million) records

- Other components of our APCD
  - Annual Medicare data files (eligibility, all service types except Rx)

Current Uses of All-Payer Claims Database

- Consumer-focused reports on cost & utilization of health care services

- Legislatively required analyses

- Multi-payer PCMH program functions
  - Patient attribution and shared savings

- Comparison studies of small group market, individual market, larger employers, and MHIP

- Other research studies

All Payer Claims Database

- Claims data suffers from identity gap challenges similar to those associated with clinical data.

- The Maryland Health Care commission has worked with CRISP to assign the Unique ID created by the MPI to each claim submitted by carriers to the APCD.

- This Unique ID assignment can allow individual patient analysis even when there are changes in coverage.

- The unique ID also enables data to be linked across data sets that have been associated with the same Unique ID.

- If SIM is funded, the APCD data set will be deployed to allow for similar data visualization and analysis as shown in previous slides.

Carriers	APCD Data Warehouse	CRISP MPI
1. Submit Demographics File	2. Data Quality Checks	3a. Matching
	3b. Load Members' Demographics	
	4. Link Member IDs to EIDs	
	5. Mask EID	
	6. APCD Output File	

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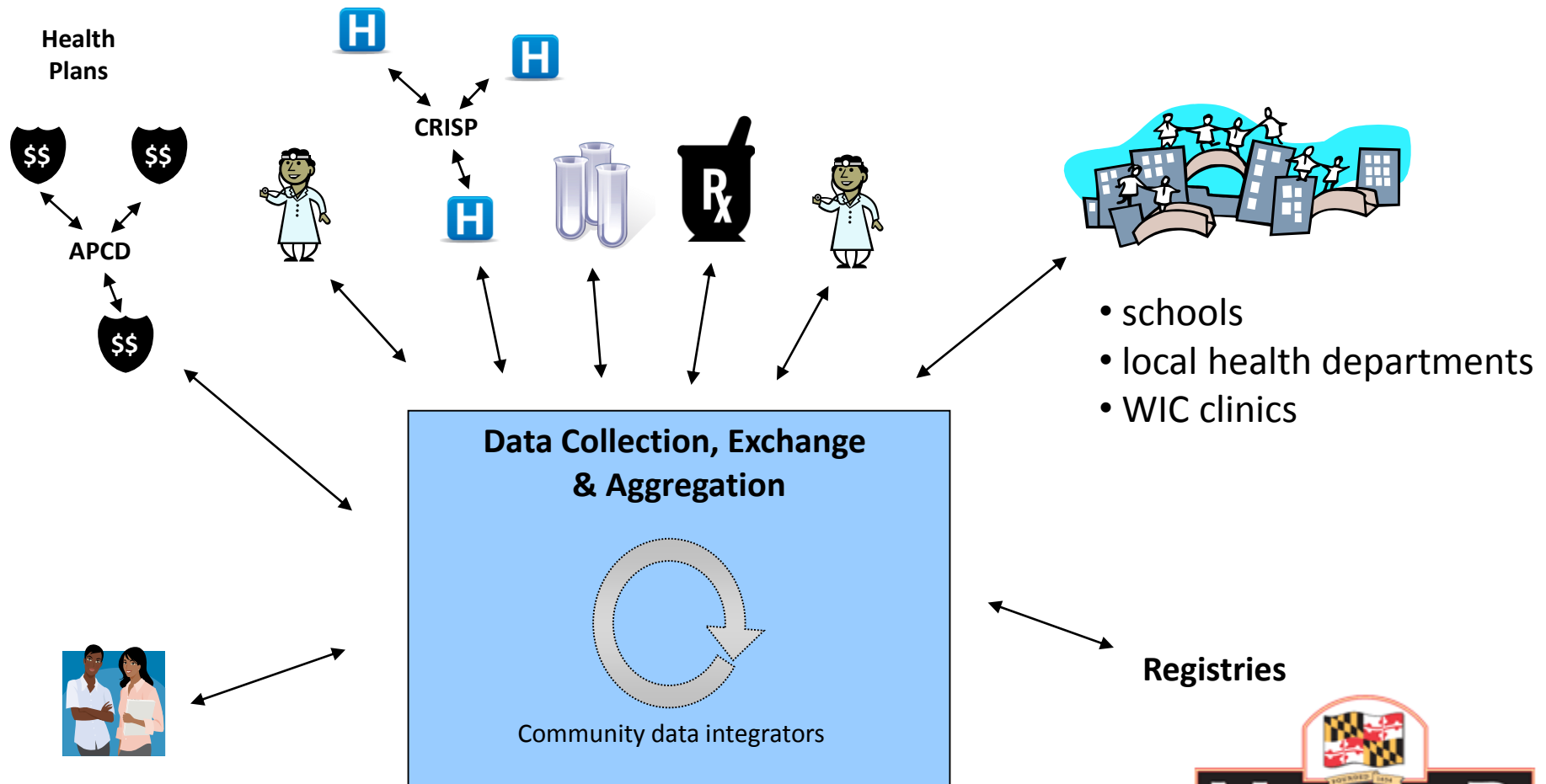DEPARTMENT OF HEALTH
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Future Uses of All-Payer Claims Database

- Moving from yearly submission to quarterly submission of data
- Adding Medicaid MCO, self-insured plans, and more detailed Medicare data
- Developing Practitioner Performance Measurement project
  - Additional data flows will allow for reports on provider quality, cost, and efficiency
  - Start with a limited set of performance measures and then expand over time
  - Will develop and test each performance measure
    - Quality: NQF-endorsed measures
    - Alternative measures: cost/resource use; efficiency
  - Risk adjustment for patient mix
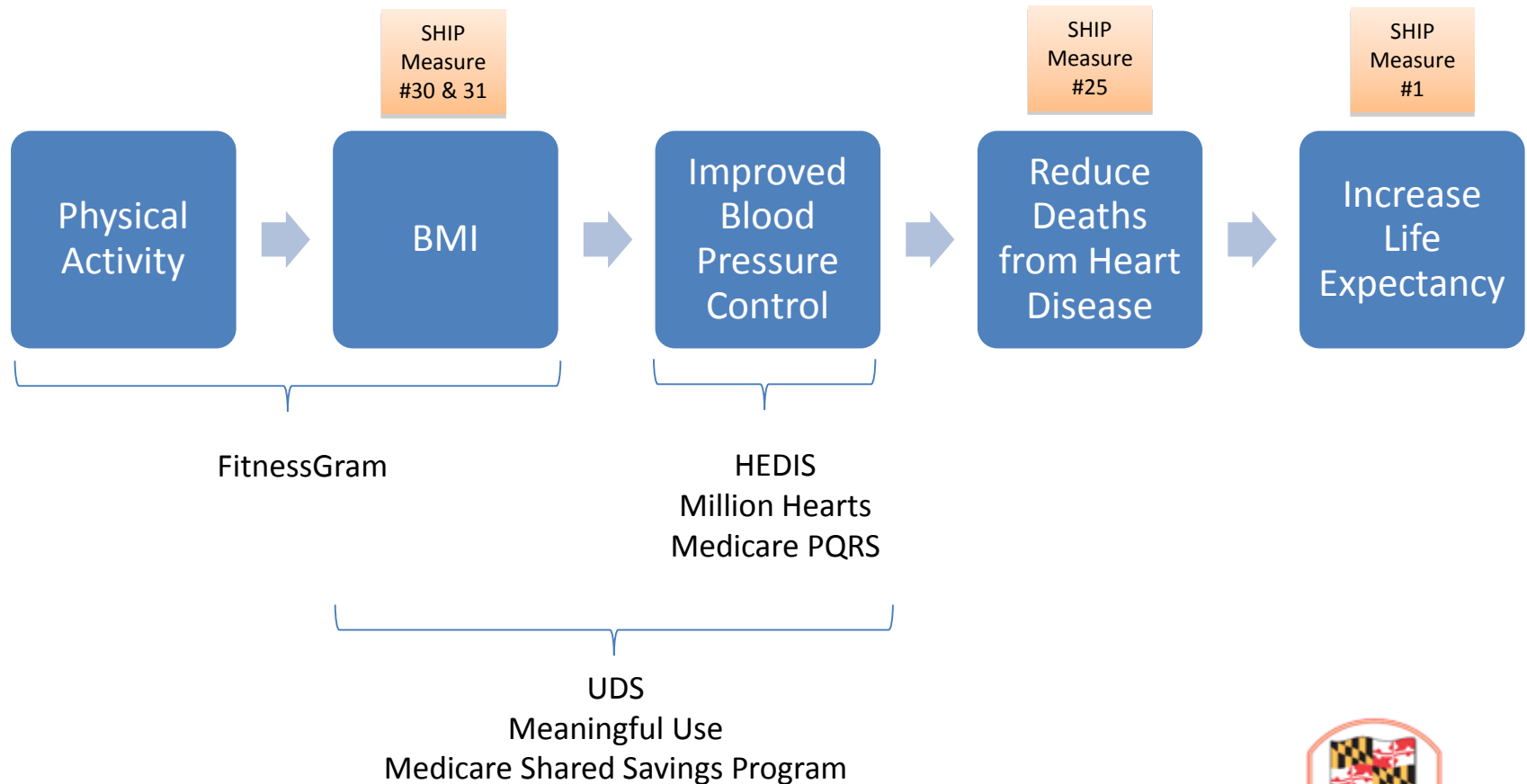 - Specialty-specific measure sets will be developed

Future Population Health IT Goals

- Data integration across data sources

- Develop original predictive models to analyze CIMH data and provide population-based decision support to all stakeholders in real-time
  - Incorporate GIS data analytics into predictive modeling

- Redefine and recalibrate various quality measures (e.g., CMS and NCQA measures for ACOs) on a community and/or population level

- Develop advanced computational techniques to efficiently and effectively analyze Big Data resulting from CIMH model while developing new techniques to deal with unstructured data captured in the CIMH model (e.g., cutting edge text mining (NLP) customization, integration and automation)

SHIP 2.0: "Intermediate" Measures & Data Integration Across Data Sources

Health Plans

$$ APCD $$

CRISP

Data Collection, Exchange & Aggregation

Community data integrators

- schools
- local health departments
- WIC clinics

Registries

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Thank you